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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/381,061	12/06/1999	MASAYUKI TODA	FUK-59	3463
22855	7590	02/23/2006		
RANDALL J. KNUTH P.C. 1507 YUMA CT MUFREESBORO, TN 37129			EXAMINER BUEKER, RICHARD R	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/381,061	<b>Applicant(s)</b> TODA ET AL.	
	<b>Examiner</b> Richard Bueker	<b>Art Unit</b> 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 December 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 1763

Claims 1 and 3-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The newly added limitation of "said plurality of fine centering pores being disposed radially outward of a periphery of said substrate body" defines the claimed apparatus structure in terms of its relationship to a substrate body which is not part of the claimed apparatus. The particular size and shape of the substrate is an undefined variable. The substrate could be a wafer that is 2 inches, 3 inches or 4 inches in diameter, or some other size. Therefore the claimed apparatus is defined in terms of an undefined variable, and is indefinite. See Ex Parte Brummer, 12 USPQ2d 1653.

Claims 1 and 4-8 stand rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hiura (JP 59-215718).

Hiura discloses a wafer floating apparatus having fine pores for ejecting gas. Compare Fig. 2 of Hiura to applicants' Figs. 3(a)-3(c). Hiura teaches the use of (1) pores for floating the wafer (labeled 5 in Fig. 2), (2) pores for rotation (labeled 6) and (3) positioning gas pores (labeled 4).

Applicants have argued that their alleged invention is distinguished from Hiura by the provision of a fourth group of pores, described as "auxiliary fine suppression pores configured for suppressing vibration of the substrate when the substrate is rotated at high speeds". Hiura does not specifically describe a fourth group of pores named "auxiliary fine suppression pores" in the manner that applicants do.

Art Unit: 1763

Applicants' auxiliary pores, as claimed and as described in the specification, do not distinguish over the fine pores taught by Hiura.

Applicants' description of their auxiliary pores can be found at page 6, lines 12-21 of the specification as follows:

"the auxiliary fine pores are provided on a surface of the floating unit, and further fine pores are oriented to a center of the floating unit on a circle with a larger radius as compared to that of the floating unit at an angular space of 90 degrees therebetween in the outer side from the positions of the pores for rotation, so that, when a substrate body is rotated and a rotational speed of the substrate body is raised, the substrate body is prevented from jumping out from the floating apparatus".

Further description of applicants' auxiliary holes can be found at page 19, lines 7-19 of the specification as follows:

"The group of auxiliary fine pores shown in Fig. 3B are provided on a surface of the floating unit 301 at positions on a circle with a radius of 40 mm in the outer side from a center of the floating unit 301 at an angular space of 90 degrees and are inclined to a center of the floating unit 301. However, a radius of the circle on which the fine pores 310e constituting the group of auxiliary fine pores is not always limited to 40 mm, and may be set to any value on the condition that the circuit is positioned in the outer side from a radius of the circuit on which the fine pores for rotation are provided. Also in Fig. 3D (sic: 3B) fine pores constituting a group of auxiliary fine pores are provided at an angular space of 90 degrees, but this angle may be set to an appropriate value."

Thus, applicants' rules require that their auxiliary pores are: (1) oriented or inclined to a center of the floating unit; (2) on a circle located on the outer side of the pores for rotation (i.e. the rotation pores 310d of applicants' Fig. 3(c) or rotation pores 6 of Hiura's Fig. 2) with respect to the center of the floating unit; and (3) located along said circle with any appropriate angular spacing.

Art Unit: 1763

It is noted, however, that Hiura's positioning pores (centering pores) (labeled 4 in Fig. 2 of Hiura) meet all the requirements for the auxiliary pores as applicants describe them in the specification. At page 9, lines 3-8 of the English translation, with reference to his Figs. 1 and 2, Hiura describes his positioning pores as follows:

"A plurality of positioning gas spray nozzles [4] are located in a dispersed manner on a circle [4'] slightly larger than the outer periphery of the wafer [2], which is retained over the discharge port [3], with the discharge port [3] at the center and in a manner such that they are inclined toward said discharge port [3] side."

Hiura's positioning pores are (1) oriented or inclined to a center of the floating unit; (2) on a circle located on the outer side of the pores for rotation with respect to the center of the floating unit; and (3) located along said circle with an appropriate angular spacing. Thus, it can be seen that Hiura's positioning pores conform to applicants' rules for providing auxiliary pores. Hiura's positioning pores have the same location, discharge angle and function as applicants' auxiliary pores.

Hiura also discloses the use of "flotation gas spray nozzles [5]" which read on the "fine floating pores" recited in applicants' claim 1. See Fig. 2 and page 9, lines 11-18 of the English translation. Hiura describes the floating gas nozzles as follows:

"Next, on a concentric circle [5'] located between the circle [4'] on which the plurality of positioning gas spray nozzles [4] are arranged and the discharge port [3]. A plurality of evenly dispersed flotation gas spray nozzles [5] are provided. These flotation gas spray nozzles [5] are provided in a manner such that all of them are perpendicular to the retaining board [1] or such that all of them are inclined by a set angle toward the discharge port [3] side."

Claim 3 of Hiura also recites the flotation gas nozzles as follows:

Art Unit: 1763

"3. Said infrared irradiation treatment device for semiconductor substrates of claim 1 in which said plurality of flotation gas spray nozzles are provided in a manner such that they are inclined toward said discharge port by a set angle with respect to said retaining board."

Hiura teaches that his flotation pores can be (1) oriented or inclined to a center of the floating unit; (2) on a circle located on the outer side of the pores for rotation with respect to the center of the floating unit; and (3) located along said circle with an appropriate angular spacing. Thus, it can be seen that Hiura's flotation pores conform to applicants' rules for providing auxiliary pores. Hiura's flotation pores have the same location, discharge angle and function as applicants' auxiliary pores.

It is noted also that applicants' specification clearly states that the fine floating pores, the fine centering pores and the fine rotating pores can be used to suppress vibration, by correctly adjusting the gas supply rate flowing through each of these groups of pores. See, for example, the following passages of the specification:

page 5, lines 5-7:

"vibration of the substrate body in the horizontal direction [is] controlled to 10 mm or below by correctly adjusting a floating gas supply rate."

page 5, lines 13-16:

"it is possible to suppress vibration of a substrate body in the horizontal direction to about 5 mm or less at a given floating height by correctly controlling a centering gas supply rate."

Page 6, lines 3-6:

"By raising a rotational speed of the substrate body, vibration of a surface of a substrate body and inclination of the substrate body can be reduced."

Art Unit: 1763

Therefore, all of the fine floating pores, the fine centering pores and the fine rotating pores can be considered to inherently meet the claimed function of the “auxiliary fine suppression pores” of suppressing vibration. Since Hiura’s floating, centering and rotating nozzles operate in the same manner as applicants’ floating, centering and rotating pores, they should also be considered to inherently meet the claimed function of the claimed “auxiliary fine suppression pores” of suppressing vibration.

Applicants’ claim 1 also recites that “said plurality of auxiliary fine suppression pores being located radially further away from a center of the floating unit surface than said plurality of fine centering pores and said plurality of fine rotational pores”. This further description of the claimed floating apparatus still reads on what is disclosed by Hiura. As noted in the discussion of Hiura in the above stated rejection, Hiura teaches that his “flotation” nozzles 5 can be angled toward the center of the wafer, and as such they perform the dual function of flotation and centering. As also noted in the above rejection based on Hiura, applicants’ disclosed auxiliary fine suppression pores are functionally equivalent to Hiura’s positioning nozzles 4. Therefore, this limitation is met by Hiura, because Hiura’s positioning pores 4 (which equate to applicants’ auxiliary fine suppression pores) are radially further away from a center of his floating unit surface than his flotation nozzles 5 (which equate to applicants’ centering pores when Hiura’s flotation pores are angled to the center) and also radially further away than his rotation pores 6.

Applicants have amended independent claims 1, 5, 7 and 8 to recite that "said plurality of fine centering pores being disposed radially outward of a periphery of said substrate body". Additionally, applicants have argued that Hiura's inclined flotation gas spray nozzles 5 do not meet this newly added requirement. Careful consideration of this new claim language, however, shows that it does read on Hiura's inclined floatation nozzles 5. It is noted that the dictionary definition of "periphery" includes "the external boundary or surface of a body". In the case of Hiura's wafer substrate 2, the external surface includes the lower surface located above the nozzles 5. Therefore, Hiura's nozzles 5 are located "outward of a periphery of the substrate body". The newly added limitation also requires the recited centering pores to be "radially outward of a periphery substrate body" (emphasis added). First, it is noted that applicants' specification at page 5, lines 8-11, which applicants cite for support of this new limitation, does not include the phrase "radially outward", but instead uses the phrase "the outer direction". Thus, it is not immediately evident what is meant by the use of the word "radially". It is noted that the dictionary definition of "radial" includes "arranged or having parts arranged like rays", and "characterized by divergence from a center". The claims do not indicate what center is intended. Therefore, it is assumed that the center of the substrate body is the center that is referenced by the use of the word "radially". It can be seen from Fig. 1 of Hiura that a line or ray can be drawn from the center of the wafer substrate 2 to each of the nozzle holes 5. Each nozzle hole 5 would therefore lie on a ray, "radially outward of a periphery of said substrate body" as now claimed.



Regarding claim 8, it is noted that the preamble of claim 8 recites "(a) substrate body-floating type of film forming apparatus", while Hiura does not discuss using his floating apparatus as a film forming apparatus. It is noted, however, that claim 8 does not recite any apparatus structure specifically relating to film forming. The reference to film forming in the preamble of claim 8 is a recitation of intended use, and Hiura's apparatus is inherently capable of being so used. It is well known in the art that a reactive coating gas can be used as a substitute for inert gas as the floating gas in a floating apparatus of the type disclosed by Hiura. See, for example, Aschner (6,005,226) at col. 3, lines 48-52. Therefore, Hiura's disclosed apparatus inherently includes all the apparatus structure necessary to be used according to the intended use recited in the preamble of claim 8.

Claims 7-9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Granneman in view of Hiura, Kisa and Foster. Granneman (abstract) teaches that a substrate can be coated by chemical vapor deposition (CVD) by supplying a coating precursor gas while the substrate is supported by flotation gas in a substrate flotation unit. It would have been obvious to provide the flotation pores of Granneman's wafer processing apparatus in the pore arrangement disclosed by Hiura and Kisa because Hiura and Kisa teach that such a pattern of holes can successfully be used to process a semiconductor wafer. Foster is cited for his teaching that it is desirable to rotate a wafer during CVD, and therefore one skilled in the art would have recognized that the floating wafer rotation means of Hiura and Kisa was useful and desirable in a floating wafer CVD apparatus such as that of Granneman.

Art Unit: 1763

Claim 9 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Granneman in view of Hiura, Kisa and Foster, and in further view of Nishitani and White, who teach the use of a gas distribution nozzle of a diameter equal to the diameter of a wafer to be coated in a CVD apparatus. It would have been obvious to use such a nozzle in the apparatus of Granneman because Nishitani and White teach that such a nozzle can successfully be used to supply coating gas to a wafer in a CVD apparatus.

Claims 7-9 stand rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Aschner or Maruyama, who both disclose an apparatus for floating, rotating and CVD coating a wafer. The gas ejection pores of Aschner and Maruyama inherently perform the functions of both floating and rotating the wafer. Regarding the function of suppressing vibration, it is noted that vibration can inherently be suppressed by adjusting the rate of rotation, and therefore the gas ejection pores of Aschner and Maruyama are inherently capable of performing the function of suppressing vibration. It is noted also that claims 7-9 do not require the presence of centering pores.

Claim 3 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

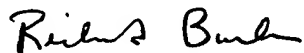
Art Unit: 1763

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (571) 272-1431. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parvis Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Richard Bueker  
Primary Examiner  
Art Unit 1763